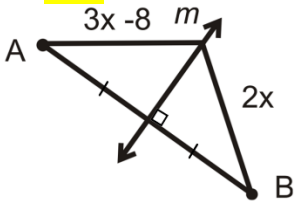
Name: _____KEY_____Hr:_____

Section 8.5 Perpendicular Bisectors

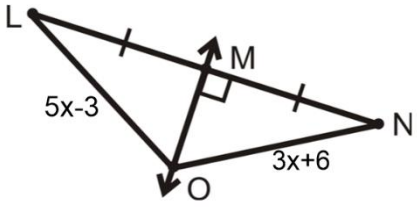
Perpendicular Bisector Theorem: If a point is on the perpendicular bisector of a segment, then it is equidistant from the endpoints of the segment.

Converse of the Perpendicular Bisector Theorem: If a point is equidistant from the endpoints of a segment, then it is on the perpendicular bisector of the segment.

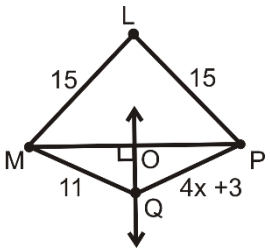
1. **X = 8**



2. **X = 9/2 or 4.5**

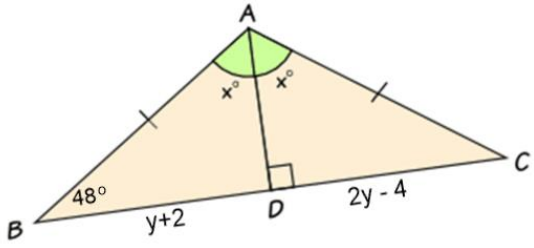


3. **X = 2**

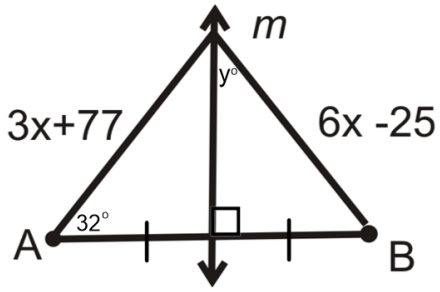


For Questions 4-5 find x and y.

4. **X = 42°** **y = 6**

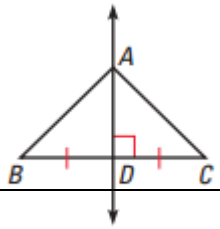


5. **X = 34** **y = 58°**



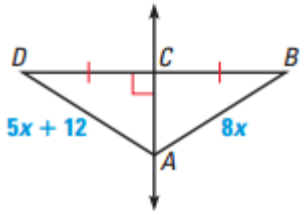
Prove the Perpendicular Bisector Theorem

6. Given: $\overleftrightarrow{AD}$ is the $\perp$ bisector of $\overline{BC}$
   Prove: $AB = AC$



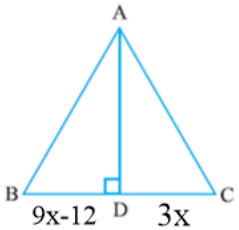
Statement	Reason
1. $\overleftrightarrow{AD}$ is the $\perp$ bisector of $\overline{BC}$	1. Given
2. $\overline{DB} \cong \overline{DC}$	2. Definition of a bisector
3. $\angle ADC$ and $\angle ADB$ are right angles	3. Definition of Perpendicular
4. $\angle ADC \cong \angle ADB$	4. Right angles are congruent
5. $\overline{AD} \cong \overline{AD}$	5. Reflexive Property of Congruence
6. $\triangle ADB \cong \triangle ADC$	6. SAS
7. $\overline{AB} \cong \overline{AC}$	7. CPCTC
8. $AB = AC$	8. Definition of Congruent segments

7. Given: $\overleftrightarrow{AC}$ is the $\perp$ bisector of $\overline{DB}$
Prove: $AB = 32$



Statement	Reason
1. $\overleftrightarrow{AC}$ is the $\perp$ bisector of $\overline{DB}$	1. Given
2. $\overline{AB} = \overline{AD}$	2. Perpendicular bisector theorem
3. $AD = 5x+12$; $AB = 8x$	3. Given
4. $8x = 5x+12$	4. Substitution property of equality
5. $3x = 12$	5. Subtraction property of equality
6. $x = 4$	6. Division property of equality
7. $AB = 8(4)$	7. Substitution property of equality
8. $AB = 32$	8. Substitution property of equality

8. Given: $AB = AC$
$\angle ADB = 90^\circ$
Prove: $BD = 6$



Statement	Reason
1. $AB = AC$; $\angle ADB = 90^\circ$	1. Given
2. $\overline{AD} \perp \overline{BC}$	2. Converse of perpendicular bisector theorem
3. $\overline{BD} = \overline{DC}$	3. Definition of a Bisector
4. $DC = 3x$ $BD = 9x-12$	4. Given
5. $9x-12 = 3x$	5. Substitution property of equality
6. $6x-12 = 0$	6. Subtraction property of equality
7. $6x = 12$	7. Addition property of equality
8. $x = 2$	8. Division property of equality
9. $BD = 9(2)-12$	9. Substitution property of equality
10. $BD = 6$	10. Substitution property of equality